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SONCHUS ULIGINOSUS OCCURRING IN THE PHILADELPHIA AREA

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In the autumn of 1917, an unfamiliar *Sonchus* was detected along a railroad embankment near Allentown, Pennsylvania, by Mr. Harold W. Pretz, in the intensive exploration of Lehigh County which he has been carrying on for some years. A specimen was sent to the Philadelphia Academy with his annual contribution of material. The plant was far advanced into maturity, with only a few fresh heads and no achenes, but it was easily seen to be a form not commonly recognized in our flora. It was evidently not closely allied to our two common annual species of Sow Thistles, *S. asper* and *S. oleraceus*, but from its foliage and several inches of stout root, increasing in diameter to the broken end, it at once suggested a relationship with the perennial *S. arvensis*—from which, however, it appeared to differ in several points, the most striking of which was its glabrous involucre and pedicels. In 1918 another station was discovered, and with each succeeding year additional material of the plant has been coming to hand from new stations in our local area. During the season of 1921 there was a greater number of collections made, from areas more widely separated, than in any previous year—in fact almost as many as from 1917 to 1920.

We have learned, therefore, of a sufficient number of stations to show its presence in several counties of two states, and have enough intimate data on its occurrence to be reasonably certain of its actual status in our flora— particularly that it is not a mere casual appearing only in grass- or grain-fields (as so many of our new introductions). There is adequate information accumulated, it is believed, to indicate that this new weed is becoming exceptionally well established and promising to be a conspicuous and permanent element in our introduced flora.

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In the course of identifying this plant and making comparisons with other material, it became obvious that we had to do with a close ally of *S. arvensis* var. *glabrescens*, which had been recorded some years previously in America by Fernald and Wiegand.* It seemed that this form should be merely a glabrous extreme of *S. arvensis*, differing only in the lack of glandularity on the pedicels and involucre bracts—as correctly interpreted by the critical judgment of these authors. The plant of immediate concern introduced in the Philadelphia area differed from a glabrous phase of *S. arvensis* in the larger inflorescence of more numerous heads, the narrower and more cylindrical involucre, the shorter and paler bracts, the (apparently) larger heads. This plant matches well material of a species allied to *S. arvensis* from the region about the Caspian Sea—*Sonchus uliginosus* Bieb. Some European students, it may be noted, have reduced Bieberstein's species to *S. arvensis* var. *glabrescens* Günth., Grab. & Wimm.† but, although there may be some doubt as to the specific distinctness of *S. uliginosus*, it does not appear to be the same as the plant of Günther, Grabowski and Wimmer.‡

Of the half-dozen collectors who have met the plant all have furnished intimate accounts of the stations known to them. Mr. Pretz has been the most fortunate in seeing it many times.

* Fernald & Wiegand, *Rhodora*, xii. 145 (1910).

† Mr. S. F. Blake has called my attention to the fact that the name *Sonchus arvensis* var. *glabrescens* was first published by C. Günther, H. Grabowski, and F. Wimmer, *Enum. Stirp. Phan. Siles.* p. 127. 1824. It is described as "*Sonchus arvensis* . . . *B. glabrescens* nob. pedunculis calycibusque glabris. Bei Reinerz (Wiemann). Bei Einseidel in Gesenke. Aug. 21." This is a rare volume.

‡ Through the kind interest of Mr. C. A. Weatherby I have been enabled to examine the bases of the records for *S. arvensis* var. *glabrescens* by Fernald and Wiegand, as well as certain later collections similarly referred. Of these specimens at least two certainly appear to be the same as the plant here identified with *S. uliginosus*: Dry roadside back of Sibley College, Cornell University Campus, Ithaca, Tompkins County, New York, July 26, 1916, K. M. Wiegand 7327; Near Soldiers Home, Erie County, Ohio, August 1902, W. P. Holt. In view of our imperfect understanding of the relation of *S. uliginosus* to *S. arvensis* var. *glabrescens*, this determinative comment is advanced with considerable hesitancy and should be considered as only tentative or suggestive for consideration by some student of the Cichoriaceae.

He has kept detailed field-notes on the various occurrences, and through his kindness I have been privileged to draw freely from them.

The first collection of the plant was made along the Philadelphia and Reading Railway adjacent to Allentown, September 22, 1917. In the hope of getting better material the spot was visited the following year, but the station had been destroyed in the laying of additional tracks. Although this station had been lost another was discovered July 28, 1918 in Lehigh County near Emaus. There was a small colony of possibly one or two dozen plants growing close to a hedgerow, paralleling the public road and trolley-line. It occurred in rough ground largely of cinder and slag talus from the adjacent dump of the Donaldson Iron Company. The plants were already showing some clusters of mature heads, with the pappus blowing away, while others were in handsome full-bloom.

Several times, while passing rapidly, a guest on automobile rides, Mr. Pretz had made note of a conspicuous yellow-flowered plant along Walbert's Pike not far out of Allentown, but not until August 1, 1919, did opportunity occur to collect this plant and prove it to represent another station for the new *Sonchus*. It had become abundantly established on a grassy strip between the road and a cultivated field. A similar-appearing plant had also been noticed from an automobile near Dorneyville crossroads (Lehigh County) and a trip was made August 9, 1919 by Mr. Pretz for the collection of the plant. It was here found established at several places along the fence-rows on both sides of the road, and was also very abundant in an abandoned field nearby. The plants in the old field were especially vigorous and well developed, specimens over five feet high being collected. This same year, still another new station was detected: about two and a half miles west of Centre Square, Allentown. August 14, 1919 material was collected here from a fair abundance of the plant along a fence-row between road and field. A half-mile or more north of this station occurs what appears to be, observed from the passing trolley-car, another colony of the species.

In 1920, Mr. Pretz made two new collections and more observations in Lehigh County. August 15 a colony of the plant was found some two miles from Wescoesville P. O., es-

tablished on a roadside embankment adjacent to open scrub-growth by the fence-line. This colony also showed vigorous plants over five feet high. Toward the village and within about a mile of it another colony of apparently the same species was noted in conspicuous bloom in a field close to the road, but there was not opportunity for examination nor for the obtaining of material. Later in the season, September 19, and on the other side of the village still another collection was made from a fair abundance of the plant scattered over a grassy-weedy field, unplowed, and apparently mowed for hay. In adjacent fields, and a quarter-mile or more out from the village, plants from several more colonies were examined and verified as the new introduction.

The most recent collection made by Mr. Pretz was on August 14, 1921, near Walbert's, a station on the Catasauqua & Fogelsville Branch of the Philadelphia & Reading Railway. The plant here grew abundantly about the edges of a cultivated corn-field, close to the fences.

Additional information on the plant about Allentown is furnished by a collection made by Mr. Walter Benner, July 21, 1920, on a lot near 27th and Liberty Streets. This is a section of the city where there are few buildings but a considerable tract is laid out in building lots, and some are used as truck-patches. A year or two previously this particular lot apparently had been under cultivation, but was now grown up with *Lactuca Scariola* and numerous other weeds—among which *Sonchus uliginosus* had made a rather dense growth.

These stations in Lehigh County lie in a fairly circumscribed area—within about a five-mile westerly and southerly radius of Allentown.

Mr. Benner had become familiar with the plant near Allentown and during the following summer, in his vigorous collecting in Bucks County (the area in which he specializes), he detected it near Pleasant Valley, August 15, 1921, growing in a cultivated field which was then in grass but previously had been in grain. The plants were scattered over one end of the field, standing up conspicuously above the low grass. This locality is ten miles east of the nearest previously known station, Emaus.

In the course of naming various specimens for Rev. and Mrs. S. W. Creasey, who are interested in the nature work of the

Scout movement, another locality was disclosed. Through their interest it was learned that the specimen came from near Quakertown, Bucks County, Pennsylvania, having been communicated by Miss Mary H. Williams during the autumn of 1921. Two or three clumps had appeared spontaneously, some time previously, along a driveway at Cellison's Mill and because of the attractive flowers had been allowed to remain there rather than eradicated as an undesirable weed. This station is some half-dozen miles in a general southerly direction from Emaus and Pleasant Valley.

After having seen the material of *S. uliginosus* augmenting year by year, it was gratifying to discover a station myself in a new area. During the recent war years "ballast-grounds" were born anew about some of our seaports and it was possible for a later generation to experience some of the thrills, and acquire some of the enthusiasm, which the botanists of the 60's and 70's of the last century had in exploring these bits of foreign territory transplanted to our shores. It was indeed a novel and, not to be denied, fascinating experience to pass in a few moments from the streets of Philadelphia to what might readily have been some European seaport. Among scores of foreign species, which few botanists of the present generation have been so fortunate as to see growing wild in America, on one of my visits to the ballast-grounds at the foot of Wolf Street, along the Delaware River, June 27, 1921, was a *Sonchus* in its first bloom. There was a single, closely compacted colony about a foot and a half high. The knowledge that *S. arvensis* was one of the regular denizens of the ballast-grounds of the old days almost allowed me to greet the plant as an old friend among the host of strangers. But its glabrous pedicels and involucre bracts, on second examination, corrected this impression. With this occurrence in Philadelphia an extension was made of about forty miles south of Quakertown.

In recent years our knowledge of the plants of Delaware has been annually increased by Rev. J. P. Otis, and during 1921 one of his interesting discoveries was a colony of *S. uliginosus*. September 19, 1921, as he was crossing certain open ground along the Lincoln Highway near Marshallton, he was attracted by the large yellow heads of the unfamiliar species. There were some half-dozen plants growing near together (but not

forming a clump) in a dry and barren field. Evidently they were affected by the sterile soil as Mr. Otis' specimens show plants only one to two feet high. With the extension into Delaware a stretch of nearly thirty miles to the southwest of Philadelphia is added to the plant's distribution.

While the notes on this matter were in drafting there appeared in an issue of the *Journal of the New York Botanical Garden*,* under the list of accessions to the herbarium, the item "1 specimen of *Sonchus uliginosus* from Pennsylvania (Given by Mr. E. A. Rau.)" and shortly thereafter came a brief note by Dr. John K. Small in *Torrey*† amplifying this to a statement that the species, here first reported for America, was established in fields near Hecktown in Northampton County, where Mr. Rau had collected material July 21, 1921. Of this locality certain more detailed information has been furnished by Mr. Rau. The plant was found in a grain-field about a mile west of Hecktown and brought to his attention by an acquaintance interested in its identity. A large colony of it was observed. From local accounts the same species was believed to occur in other nearby fields. Hecktown is ten miles to the northeast of Allentown.

The above does not represent by any means the entirety of the field observations on the occurrence of the plant in the Philadelphia area. It is often so tall and so conspicuous when in bloom, especially in the morning when the heads are expanded, that it may readily be detected from the railroad-train, trolley-car, or automobile. Mr. Pretz has numerous notes of such probable occurrences in Lehigh County which need only closer observation or collection to be substantiated. There are also several reports from other local areas, of which specimen vouchers have not yet been obtained.

These stations lie in the counties of Northampton, Lehigh, Bucks, and Philadelphia of southeastern Pennsylvania and in Newcastle County of northern Delaware. The northernmost is Hecktown and the most southerly, Marshallton. They all lie within a rectangle about seventy miles north and south by thirty miles east and west; the meridian of Hecktown is in the median line. Its center of frequency would appear to be in Lehigh

* Journ. N. Y. Bot. Gard. xxii. 192 (1922).

† Small, *Torrey*, xxi. 100 (1922).

County, unless our knowledge of more stations there than elsewhere is due to the very acute observations of Mr. Pretz and his vigorous collecting. However, it can be asserted with confidence that no botanist in the Philadelphia area (where *S. arvensis* is a rare species) could possibly overlook a plant with such large and bright yellow heads. Its handsome bloom or the striking display of color when in quantity have invariably attracted its collectors.

From its occurrence in some cases in cultivated fields it is quite generally supposed to have been introduced with foreign seed. Its native region appears to be extreme eastern Europe and adjacent Asia—in general, the area between the Caucasus, Ural, and Altai regions. Mr. Pretz has communicated with the Office of Seed and Plant Introduction of the United States Department of Agriculture regarding the possible importation of seed from this Old World area for sale or introduction. It was learned, through Mr. S. F. Blake, that a good deal of Alfalfa seed has been imported from the Caucasus region in recent years.* *S. uliginosus* has been found with Alfalfa in some places, but Red Clover, Alsike, and various other plants of cultivation have also been noted as associates, Mr. Pretz informs me, so that its occurrence with Alfalfa has not been sufficiently marked or distinctive to make it obvious that this has been the carrier.

Except in the Allentown region, the stations are certainly so scattered and far apart that it would seem they can scarcely represent dissemination from a single station—as by natural seeding. The immediate sources of most of these stations, if not quite independent, might well be related to some large grain or seed importation, rather well distributed, which contained the weed seeds of the *Sonchus*. Introduction with imported seed seems a reasonable surmise but it must be confessed that this somewhat general belief is substantiated in most cases by little or no detailed evidence. Regarding the origin of the station near Quakertown, an acceptable view is advanced by Rev. Creasey. The plant occurs beside a grist-mill, which fact is certainly significant. But this in turn leads us to ask where was grown the grain with which the weed seeds came to the mill, and whence did the farmer originally obtain his seed-grain?

* Blake, Science, lv. 455 (1922).

Although it is not clearly demonstrated how the species arrived in this country, nor how most of the stations have originated, it is obvious that already the plant has thoroughly established itself, not only on the borders of cultivated fields and areas adjacent thereto, but along roadsides, in uncultivated lands, and waste places.* The long horizontal roots, perennial and often deep seated, suggest the possibility that in this plant we may well find a rival to the Canada Thistle in persistence.

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ADDITIONS TO THE FLORA OF WESTERN OREGON DURING 1921.

BY JAMES C. NELSON

A few more species remain to be added to the flora of the Willamette Valley as the result of the past season's collecting. Our list of local species appears to approach completion very much as certain geometric curves approach a straight line—always coming nearer, but never reaching absolute contact this side of infinity. Let it be again remarked, as in previous lists, that all of these species were growing without cultivation, and seem in all cases to be permanent members of our flora.

The total number of Oregon species that have been reported as not mentioned in Piper and Beattie's Flora of the Northwest Coast has now reached 371. Adding these to the 1617 species of that manual, we are now within 12 species of the 2000 predicted earlier in this series. Another season should complete this total.

Introduced species are marked*.

1. *Equisetum hyemale* L. var. *californicum* Milde. Not infrequent along streams in sandy woods. Determined by W. R. Maxon.

2. *Equisetum palustre* L. Very common in the low ground north of Chemawa, Marion Co., but rarely fruiting. This was

* The recent report by O. A. Stevens in the *Bulletin of the Torrey Botanical Club* for April 1922 of its frequency in the Red River Valley of North Dakota, Minnesota, and adjoining Canada is indicative of its already wide dispersal in America.